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EXAMINER	
FLANDERS, ANDREW C	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/808,895	PACHET ET AL.	
	Examiner	Art Unit	
	Andrew C. Flanders	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 28 February 2006 have been fully considered but they are not persuasive.

Applicant alleges:

> "However, O'Connell does not deal with spatialisation processing. In O'Connell, the location of the icons on the graphical display has no influence on the audio signals. Thus, moving a merged icon would also have no influence on the audio signals. O'Connell merely allows icon movement and placement for convenience purposes. Only the connections between the icons define the overall sounds treatment algorithm. Thus, the only way of modifying the influence of a sound treatment on an entering sound siral is to change the connections between the sound treatment icons. Once icons are merged if the connections are unchanged then the sounds treatments are also unchanged."

Examiner respectfully disagrees with this allegation. It is true that O'Connell does not deal with spatialisation processing as alleged by Applicant. However, the purpose for the O'Connell reference it to show that for icon based audio system configuration, multiple blocks can be merged to facilitate motion of the icon on a graphical display. O'Connell taken alone does not disclose spatialisation processing. However, in a combination, Fig. 3 of Delerue discloses a user interface with objects that can readily be moved about as desired; see paragraphs 36 - 42. O'Connell at least suggests the movement of grouped icons (i.e. merged as shown in the previous rejection). While they may not be affecting the spatialisation, when taking this movement of grouped icons and applying it to Delerue as in the previous rejection, spatialisation is affected.

Applicant further alleges:

> "Moreover, in O'Connell icons relate to sound treatments not sound sources. The spatial location of the sound sources is not dealt with in O'Connell. Each icon has a signal entry, provides a signal treatment, and provides an output signal based on this treatment. The respective positions of icons associated with the sound treatments have no influence on the sound generation algorithm since location is not a criterion for the signal treatment applied."

Again, it is true that each icon provides a signal treatment and no influence on sound location. However, it is the manipulation of the various icons in O'Connell that is used to modify Delerue. When taken in combination, the obvious modification using the manipulation (i.e. merge) taught by O'Connell effects a spatialisation in the icons of Delerue.

Applicant further alleges:

> "Thus, since the incidence of any icon motion on the sound rendering is not described or suggested by O'Connell, the merging of icons to facilitate motion for clarity can not be combined with Delerue to produce "user input for affecting a grouped spatialisation command, said command acting on a specified group of audio sources.'' Neither Delerue or O'Connell describe a spatialisation command acting on a group, a feature that requires that spatialisation sound processing problems be overcome."

Examiner respectfully disagrees. Again, sound rendering is not taught by O'Connell. Modifying Delerue to effect a manipulation of icons in a user interface as taught by O'Connell would have been obvious. It is not the actual purpose of the icon that is relied upon but the features of the user interface (both of which include icon manipulation). Thus, it is not necessary for O'Connell to effect or include sound location modification. O'Connell merely teaches a way to manipulate icons on a user screen, the obvious modification of Deleure uses this to manipulate the objects in Fig. 3 for the purpose of a cleaner looking collective operation of icons.

Additionally the arguments regarding Mitsuhashi are not persuasive for at least the reasons stated above regarding the requirement of spatialisation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 23, 32, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delerue et al (EP 0961523 A1), hereafter "Delerue", in view of O'Connell (USPN 5331111) and Mitsuhashi et al (USPN 5127306), hereafter "Mitsuhashi".

Delerue discloses the basic components and function of a music spatialization system. Specifically regarding Claim 1, Delerue teaches:

A System for controlling audio spatialisation in real time (Figure 1), comprising

input means (50) for accessing audio steam composed of a plurality of audio sources associated to audio tracks("sound tracks")(para. 0028)

constraint means (3) for receiving and processing constraint expressing rules for spatialisation of said audio stream (particularly, para. 0024-27 and 0029-0033), and

interface means (2) for entering spatialising commands to said constraint means (3)(para. 0009-0010, 0032),

While the constraints provided for in the system of Delerue may be applied to groups of sources (para. 0033-0034), Delerue does not clearly specify:

- said interface means (2) presents at least one user input for effecting a grouped spatialisation command,

- said command acting on a specified group of audio sources,

O'Connell discloses a sound model generator with a graphical programming engine. Input sources are indicated in the graphical display through the use of blocks (for example, see at least col. 17, lines 6-36; col. 41, line 68 - col. 42, line 55).

Specifically regarding Claim 1, O'Connell specifies:

> wherein said interface means (graphical display of O'Connell in view of that cited above in Delerue) presents at least one user input for effecting a grouped spatialisation command (block editing command of "Merge", in Edit menu, col. 50, lines 1-3 and 14-16, in view of nature of icons in Delerue; also, the `Algorithm' block represents merged algorithm of one or more blocks, col. 16, lines 43-49),
>
> - said command (at least "Merge") acting on a specified group of audio sources(selecting of items, col. 50, lines 16-17 in view of

audio sources being represented as such blocks, thus available for grouping),

To one of ordinary skill in the art at the time the invention was made, it would have been obvious incorporate at least the Merge function of the system of O'Connell as part of the processing options available for application to the audio source icons of the system of Delerue. The motivation behind such a modification would have been that such a function would have enabled a plurality of icons to be represented by a single icon, facilitating a cleaner looking and better organized algorithm based on the collective operation of said blocks or icons.

Regarding the remaining limitation of the claim, "said constraint means is programmed to process said group of audio sources as a unitary object for the application of said constraint variables", the nature of the components involved in such a merged block as taught by O'Connell suggest that processing of the merged block would involve equivalent such processing being propagated to each of the components represented by said merged block, else the underlying algorithm would not just be "cleaner looking" or "better organized", but rather, fundamentally altered. Such a notion, however, is espoused by the nature of the teachings of O'Connell, and not explicitly in the disclosure.

Thus, for the sake of clarity, the reference of Mitsuhashi is hereby introduced to clearly teach that such processing would be, and is known in the art to be, applied to merged or grouped sound source signals.

Therefore, in terms of clarity, the teachings of Delerue in view of O'Connell are hereby not considered to clearly specify:

- said constraint means is programmed to process said group of

Mitsuhashi that imposes control over audio signals (Figure 1, 1-11, 1

audio sources as a unitary object for the application of said constraint variables

Mitsuhashi teaches an apparatus for applying spatialized processing to musical tone signals, wherein the application of spatialization processing may be designated in terms of groups of tone signals. The teachings of Mitsuhashi equate a musical tone to an output of a musical instrument (for example, col. 1, lines 52-66 or col. 4, lines 6-14).

Specifically regarding Claim 1, Mitsuhashi, in view of the other applied reference(s), teaches or at least suggests:

said constraint means (signal processing circuitry of Mitsuhashi that imposes control over audio signals (Figure 1, 1-11,1-12,1-13), in view of signal processing control circuitry (3) of Delerue) is programmed to process said group of audio sources (grouped sound source channels, col. 10, lines 29-36) as a unitary object for the application of said constraint variables (processed as a group, thus exhibiting unified control or treatment of tone signals as unitary object, col. 9, lines 21-26; col. 10, lines 29- col. 11, line 35; col. 17, lines 34-40; again, panning or image localizing control of Mitsuhashi being taken in view of constraint based signal control of Delerue).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to apply unified, constraint-based control to audio sources grouped in the system of Delerue in view of O'Connell, as is taught for the grouped audio signals in the system of Mitsuhashi. The motivation behind such a modification would have been that the application of such unified, constraint-based control would have eliminated the need for a user to repeatedly select different audio

signal sources in order to repeatedly input or effect the same constraint or control data.

Regarding **Claim 2**, Delerue in view of O'Connell particularly suggests:

wherein said group of audio sources (blocks may be grouped, O'Connell, col. 50, lines 14-17, as detailed above, taken in view of input sources being blocks, as well as the nature of representation of said blocks in Delerue) is identified with a respective group of individually accessible audio tracks (different inputs in system of Delerue, represented by icons 21, correspond to different tracks, para. 0028; again, component blocks may be merged, as is taught by O'Connell).

Regarding **Claim 3**, Delerue particularly suggests:

wherein said group of audio sources reflects an internal coherence with respect to said rules for spatialisation (constraints may be placed between original source icons, para. 0033, in view of grouping of such blocks or sources as is taught in O'Connell and Mitsuhashi).

Regarding **Claim 4**, Delerue in view of O'Connell and Mitsuhashi at least suggests:

wherein said interfacing means (2)(such as display, Figure 3, Delerue) is adapted to display:

at least one group icon (H) representing a grouped spatialisation

command (grouped into single icon, col. 50, lines 14-16, O'Connell),

said icon being positioned according to a topology reflecting a spatialisation and being displaceable by a user (icons represent spatialization, may be moved on display, para. 0023-0028 of Delerue),

and links between said icons expressing constraints to be applied between said group icons (links between icons, Figures 24-28 of O'Connell, in view of merged, single icon of O'Connell noted above and concept of constraints being visually illustrated, as evidenced by Figure 6 and para. 0036, 0058 of Delerue).

Regarding **Claim 5**, Mitsuhashi at least suggests:

further adapted to process global commands through said interface means (2)(comprising input, such as "single manipulator" involving a plurality of groups of audio sources simultaneously (col. 2, lines 16-30).

Regarding **Claim 6**, Mitsuhashi particularly discloses:

wherein said global commands comprise at least one among:

- a balance between a plurality of groups of audio sources (panning, col. 1, lines 21-25; col. 2, lines 23-31), and

- a volume level whereby positions of groups can be changed simultaneously in a proportional manner.

Regarding **Claim** 7, Delerue in view of O'Connell and Mitsuhashi particularly at least suggests:

wherein said constraints are one-way constraints (control voltages are designated in terms of groups, col. 11, lines 2-11 of Mitsuhashi; such a group-based control is then applied (via VCAs, col. 11, lines 11-21 of Mitsuhashi) to signals involved in such groups; alternately stated, control applied via `group' designation to individual sources; such `control' taken in view of functional relationships between icons or function blocks in Delerue being expressed as `constraints', para. 0024-0027),

each constraint having a respective set of input and output variables (V) (individual sources have positions or `variables' in system of Delerue, para. 0031; merging or grouping blocks in O'Connell creates single icon, col. 50, lines 14-16, which would also have position on screen, as an icon is a graphical or displayed object;

above control or constraint flow noted in Mitsuhashi relates the positions of group icons as `input variables' and the underlying positions of the source icons as `output variables') entered by a user through said interface (merging or forming of single icon from function or source icons is user controlled, col. 50, lines 16-17 of Mitsuhashi)

Regarding **Claim 23**, Delerue, in view of the teachings of other applied reference(s), at least suggests: said constraints comprise functional and/or inequality
constraints (para. 0037),

wherein cyclic constraints (constraints linked to variables affected by a first constraint) are processed through a propagation algorithm by merely checking conflicts (determination of compatibility for

a variables computed new values and prior new value, new values for variable are not adjusted; checked for compatibility, else `no solution is returned'; para. 0044-0059).

Regarding **Claim 32**, O'Connell, in view of the teachings of other applied reference(s), at least suggests:

said constraint means (3 of Delerue in view of controller of O'Connell) is configured to execute a test algorithm (col. 56, lines 28-30).

Regarding **Claim 42**, O'Connell, in view of the teachings of other applied reference(s), at least suggests:

A computer program product (initial source of data representing the engine) loadable into the internal memory unit (13) of a general-purpose computer (10)(col. 4, lines 54-56), comprising a software code unit (data representing engine, loaded into 10) for coding the system according to claim 1 (in view of system of claim 1 detailed above) and

implementing the means described in said system (engine format of invention of O'Connell in view of elements (such as 1-5) of Delerue as addressed and modified above in regards to Claim 1),

when said computer program product is run on a computer (col. 4, lines 44-61 of O'Connell in view of para. 0064 of Delerue).

Regarding **Claim 43**, please refer above to the functions implemented by the elements cited above in regards to the similar limitations of Claim 1.

Claims **8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Delerue in view of O'Connell and Mitsuhashi as applied above, and in further view of MusicSpace application, copyright 1998.

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field controlsystem. Mitsuhashi teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings.

While Delerue denotes that the information pertaining to the locations of the signal sources may be stored in storage means (1)(para.. 0021), the composite system, in view of the modifications proposed above does not clearly teach or suggest:

- that the system is further adapted to provide a program mode for the recording of mixing constraints entered through said interface means in terms of constraint parameters operative on said groups of audio sources and components of said groups.

However, the MusicSpace application, hereafter "MusicSpace", was a program for spatializing music sources that included a variety of spatialization features.

Specifically regarding Claim 8, the MusicSpace program included:

that the system (MusicSpace system in view of system of Delerue in view of O'Connell and Mitsuhashi disclosed above) is further adapted to provide a program mode (controlled by record button, under `Midi Player Palette') for the recording of mixing constraints entered through said interface means (movements of sources made by user) in terms of constraint parameters operative on said groups of audio sources and components of said groups (MusicSpace operates under constraint system, `Constraints Palette', in view of controls further discussed above in view of O'Connell and Mitsuhashi).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include a record mode function, such as that included in MusicSpace, as part of the music spatialization system of Delerue in view of O'Connell and Mitsuhashi. The motivation behind such a modification would have been that such a record feature would have enabled the playback or reproduction for a user of the movements applied to the music sources of an involved sound field.

Regarding Claim **9**, MusicSpace particularly teaches or suggests:

wherein said interface means (2) (comprising displays in Tutorial) is adapted to present each said constraint by a corresponding icon (ball/circle) such that they can be linked graphically to an object to be constrained through displayed connections (Tutorial 4/5 illustrates constraint as ball icon connected to selected objects).

7. **Claims 10 and 14-18, 26, 31, 33, 36-38, 40** are rejected under 35

U.S.C. 103(a) as being unpatentable over Delerue in view of O'Connell and Mitsuhashi as applied above, and in further view of Lydecker et al (US 2003/0028273), hereafter "Lydecker".

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field control system. Mitsuhashi teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings.

As noted in Delerue, the constraints represent control data pertinent to the location of sound sources in a sound field (para. 0024-25).

However, Delerue in view of O'Connell and Mitsuhashi does not clearly specify:

- said constraints are recorded in terms of metadata associated with said audio stream

Lydecker discloses a recording and playback control system. In the system of Lydecker, multiple channels of audio data are interleaved with acoustic control data. The control data at least in part may be entered by a producer of the multichannel compilation (para. 0017-27).

Regarding Claim 10, when taken in view of the teachings of Delerue, O'Connell, and Mitsuhashi as applied above, Lydecker teaches or

at least suggests:

said constraints (control data of Lydecker, para. 0017-27, in view of control data or constraints of Delerue) are recorded in terms of metadata (sector 46, Figure 2) associated with said audio stream (such sectors 46 may be in every sector 40; data in sector 46 pertains to recording and reproduction of program data, para. 0017, 0028-0030, 0039-0045)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to record the constraint data of Delerue in view of O'Connell and Mitsuhashi in the manner disclosed for the acoustic control data in the system of Lydecker. The motivation behind such a modification would have been that such a recording manner would have enabled a producer of the multichannel audio presentation to specify particular parameters for the reproduction of the performance. Such parameters would have enabled an end user or customer to receive or derive default or automatic playback parameters for the reproduction of the multichannel audio, as is noted by Lydecker.

Regarding **Claim 14**, Lydecker particularly suggests:

wherein multiple audio sources for said spatialisation are accessed from a common recorded storage medium (audio and control data from DVD, para. 0031).

Regarding **Claim 15**, Lydecker particularly suggests:

wherein said constraints are accessed from said common recorded medium as metadata (AVCD data is descriptive of audio data, para. 0018-

0027; demuxed from DVD data and applied to separate buffers, para. 0031).

Regarding **Claim 16**, Lydecker, in view of the teachings of other applied reference(s), at least suggests:
said metadata (control AVCD, in view of constraints of Delerue) and said tracks (audio data) in which said audio stream is recorded are accessed from a common file (control data and audio data are in same sector of DVD format, para. 0028-0030; a File on a DVD is set ofsuch sectors with sectors in a continuously ascending sequence, per the UDF Bridge file format of the DVD specification)

Regarding **Claim** 17, Lydecker, in view of the teachings of other applied reference(s), at least suggests:

further comprising an audio data and meta data decoder (demux 52 and circuitry for other control operations, such as error correction, para. 0031) for accessing from a common file (file comprising sectors such as shown in Figure 2, para. 0029-31) audio data (program data 44) and metadata expressing said constraints (46, control data in view of control data/constraints denoted by Delerue) and recreating (separating into buffers, 54,56) therefrom:

a set of audio streams from each individual track contained in said file(program data 44, which is multichannel stream data, para. 0016; six streams, for example, para. 0033), and

the specification of said metadata (AVCD section 46) from an encoded format (partitioned and assigned parity and error correction codes, para. 0039) of said file (overall file of sector shown in Figure

2)(control data AVCD is buffered, 54, para. 0031, taking such control data in view of control/constraint data of Delerue; data in 54 utilized in the control of playback of audio streams, para. 0041).

Regarding **Claim 18**, O'Connell, in view of the teachings of other applied reference(s), at least suggests:

System according to claim 1 implemented as an interface (graphical programming engine) to a computer operating system (components of engine executed by host system, col. 5, lines 23-41; col. 12, lines 1-18) and a sound card (18)(col. 4, lines 57-61; col. 12, lines 1-18)

Regarding **Claim 26**, Delerue in particular view of Lydecker, in view of the teachings of other applied reference(s), at least suggests:

a constraint system module (code underlying 3 and 4 of Delerue) for inputting a database describing the constraints and relating constraint variables for each music title (setting of constraints in solver 3, para. 0032 of Deleue, in view of receipt and application of control data, para. 0031 and 0041 of Lydecker), thereby creating spatialisation commands (active constraints in 3 impart spatialization commands via an output to 4, para. 0024-0028, 0032 of Delerue); and

a spatialisation controller module (code underlying 5 of Delerue) for inputting said set of audio streams given by encoding means (28,30 of Lydecker) (input 50 of Delerue, para. 0028, in view of muxing and formatting of multiple tracks and control data in Lydecker, para. 0028), and

spatialisation commands (from 4) given by said constraint system

module (para. 0028).

Regarding **Claim 31**, Delerue, in view of the teachings of other applied reference(s), at least suggests:

said spatialisation controller module is a remote controllable mixing device (para. 0028).

Regarding **Claim 33**, Delerue, in view of the teachings of other applied reference(s), at least suggests: A spatialisation apparatus (computer, para. 0064 of Delerue) comprising:

- a personal computer (computer of Delerue, para. 0064, in view of computer of O'Connell, col. 4, lines 44-56) having a data reader (col. 5, lines 9-21 of O'Connell in view of reading components of Lydecker, para. 0031) for reading from a common data medium both audio stream data and data representative of constraints for spatialization (audio data and control/AVCD of Lydecker, para. 0031 in view of constraint controls of Delerue), and

- an audio spatialisation system according to claim 1 (para. 0020 of Delerue in view of modifications noted above in claim 1), having its input means (50) adapted to receive data from said data reader (reading and buffering of audio and control data from DVD of Lydecker, para. 0031, in view of input 50 of Delerue, para. 0028).

Regarding **Claim 36**, Lydecker, in view of the teachings of other applied reference(s), at least suggests:

A storage medium (DVD) containing data (applied to 52,54)

specifically adapted for exploitation by an audio spatialization control system according to claim 1 (control of audio data, para. 0041, in view of system of Delerue, para. 0020 and modifications noted above with regards to Claim 1) comprising a plurality of tracks forming an audio stream (para. 0016) and data representative of said processing constraints (control data, para. 0017, in view of constraints as control as taught by Delerue; combined audio and control data on DVD, para. 0028 of Lydecker)

Regarding **Claim 37**, Lydecker, in view of the teachings of other applied reference(s), at least suggests:

wherein said data representative of said processing constraints (control data, para. 0017, in view of constraints as control as taught by Delerue) and said plurality of tracks (multichannel audio, para. 0016) are recorded in a common file(control data in every sector with audio data, para. 0030; audio data is mixed multichannel stream, para. 0016; sectors of DVD are subsections of over all file on DVD, per DVD standard, thus, sectors of Figure 2 represent overall, common file).

Regarding **Claim 38,** Lydecker, in view of the teachings of other applied reference(s), at least suggests:

wherein said data representative of said processing constraints (in 46) are recorded as metadata with respect to said tracks (in 44) (Figure 2; data in section 46 pertains to data in 44, para. 0017-0028; control data may be recorded in every sector, para. 0030).

Regarding **Claim 40**, Lydecker, in view of the teachings of other

applied reference(s), at least suggests:

in the form of any digital storage medium (DVD, para. 0028-0029).

Claims 11-13 are rejected under 35 U.S.C. 103(a) as unpatentable over Delerue in view of O'Connell and Mitsuhashi as detailed above, and in further view of Tsuji et al (WO 99/40566), hereafter "Tsuji". For the purposes of rejection, reference will be made in the following rejection to USPN 6782299, which is the corresponding U.S. application for this reference.

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field control system. Mitsuhashi teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings.

Delerue discloses expressions of constraints that involve both constraint and variable portions (para. 0035-36, for example).

However, Delerue in view of O'Connell and Mitsuhashi does not clearly specify:

- wherein each constraint is configured as a data string containing a variable and a constraint part.

Tsuji discloses a format for control data, wherein the applied controls may pertain to manipulation of audio data.

Specifically regarding Claim 11, Tsuji, in view of the above applications of the reference of Delerue, O'Connell, and Mitsuhashi, at least suggests:

wherein each constraint (audio control data of Tsuji, col. 5, lines 39-43, in view of control expressed in equations in para. 0035-36 of Delerue) is configured as a data string (col. 5, lines 51-56) containing a variable (ID code of object to be controlled, col. 10, lines 7-45,

> in view of control of particular tracks/sources of Delerue) and a constraint part (type of control, col. 5, lines 39-42 in view of types of controls or constraints of Delerue)(col. 3, lines 20-28).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to utilize the control data format of the system of Tsuji for the coded expression of the constraints and constraint properties expressed in the system of Delerue in view of O'Connell and Mitsuhashi. The motivation behind such a modification would have been that such a format would have enabled the control of the reproduction of an arbitrary signal source even if a plurality of audio signals are implemented in the system.

Regarding **Claim 12,** Tsuji particularly discloses:

wherein said variable part expresses at least one among

- track identification data (at least ID taught by Tsuji, col. 10, lines 7-41),

Regarding **Claim 13, Tsuji** particularly discloses:

said constraint part expresses at least one among:

a constraint type (at least control type, in view of constraint types of Delerue, is taught by **Tsuji, col.** 5, lines 39-42), q

Claims 19, **20, 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Delerue in view of O'Connell and Mitsuhashi as applied above, and in further view of Bargen, B. et al., "Inside DirectX", Microsoft Press, Redmond, WA, 1998., pages 3-9, 26-29, 203-205, 223-233, 241-247, 249-266. Hereafter, this reference will be referred to as "Bargen".

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field control system. Mitsuhashi teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings.

O'Connell particularly teaches the use of a sound accelerator board as part of a system running a graphically based audio program or engine, which reads on "cooperating with a sound card" (col. 4, lines 57-61).

However, Delerue in. view of O'Connell and Mitsuhashi does not clearly specify:

cooperating with a sound card and three dimensional audio buffering means said buffering means being physically located in a

memory of said sound card so as to benefit from three-dimensional acceleration features of said card

DirectX is a middleware software system produced by Microsoft comprising tools for the implementation of video and audio in a computer environment.

> Specifically regarding Claim 19, DirectX teaches:
>
> cooperating with a sound card ("sound cards")and three dimensional audio buffering means ("secondary buffer with 3D capabilities")(pages 225,258)
>
> said buffering means being physically located in a memory of said sound card so as to benefit from three-dimensional acceleration features of said card (page 225)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the system of Delerue in view of O'Connell and Mitsuhashi utilizing the DirectX software platform. The motivation behind such a modification would have been that a composite system implemented in such a manner would have provided access for the spatialization system to multimedia hardware in a device-independent manner, enabled hardware advances to be taken advantage of as they occur, and maximized hardware support across a variety of hardware configurations. Utilizing buffers on a sound card, as is noted by DirectX, would have ensured that a throughput sound would take the shortest route to a primary buffer, the main output buffer for a sound card. Utilizing the 3D sound capabilities of DirectX would have enabled the implementation of real-time, fully animated 3D environments under the Windows operating system.

Regarding Claim 20, DirectX, in view of the teachings of other applied reference(s), at least suggests:

a waitable timer for controlling writing tasks into said buffering means (code that implements polling, checking the buffers at regular intervals for the purpose of delivering data thereto; page 241).

Regarding **Claim 22**, DirectX, in view of the teachings of other applied reference(s), at least suggests:

adapted to cooperate with a three dimensional sound buffer (page 258) for introducing an orientation constraint (orientation is a property of 3D DirectX buffer; pages 252-253 and 260; taken in view of setting of constraints in Delerue for property of position relative to listener, para. 0036, which is another property of DirectX sound buffers, page 251).

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delerue in view of O'Connell and Mitsuhashi as applied above, and in further view of Beard et al (USPN 5451942), hereafter "Beard".

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field control

system. *Mitsuhashi* teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings. However, Delerue in view of O'Connell and Mitsuhashi does not clearly specify:

> said input means is adapted to access audio tracks of said audio stream which are interlaced in a common file

Beard discloses a system for multiplexing multi-track digital audio signals onto a single, conventional recording media.

Regarding Claim **21**, Beard, in view of the teachings of other applied reference(s), at least suggests:

> said input means (comprising 16, 18 of Figure 2, in view of input to 5 in Delerue) is adapted to access audio tracks (output to D1-Dn) of said audio stream (originally from 14) which are interlaced in a common file (media played *by* 14)(col. 4, line 44- col. 5, line 7)

To one of ordinary skill in the art at the time the invention was made, it would have been *obvious* to incorporate the playback, receiver, demux, and decompression means of Beard as part of the input components associated with the audio input (50) in the system of Delerue in view of O'Connell and Mitsuhashi. The motivation behind such a modification would have been that an addition of such components would have enabled the composite system to read complementarily encoded media; such encoded media comprises much higher quality multichannel audio stored thereon than is normally attainable for said encoded media. The composite playback system would have been able to handle different initial types of audio inputs without requiring exotic new components for handling said inputs.

11. Claims 24-25, 39, and 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delerue in view of O'Connell and Mitsuhashi and as applied above to Claim 16, and in further view of Lydecker and Beard et al (USPN 5451942), hereafter "Beard".

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field control system. Mitsuhashi teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings. Lydecker discloses the combining of both audio and control data onto a disc media.

Lydecker particularly teaches that control (AVCD) data, taken in view of the constraint data disclosed by Delerue, may be provided on every sector of the DVD, which reads on interlacing the control or constraint data with every file on the DVD, by virtue of sectors being subparts of files according to DVD recording specifications.

Thus, similar to the limitations of Claim 16, the multiplexing of Lydecker is considered to at least suggest "a means for encoding individual sound sources and a database describing the constraints and relating constraint variables into a common audio file". The teachings of Lydecker are applicable to the teachings of Delerue, O'Connell, and Mitsuhashi, again, because such encoding would have enabled a producer of the musical tracks to provide controls for the reproduction of the data.

However, Delerue in view of O'Connell, Mitsuhashi, and Lydecker does not clearly teach or suggest:

> a means for encoding individual sound sources and a database describing the constraints and relating constraint variables into a common audio file through interlacing.

Specifically, the above combination is not considered to teach or clearly suggest that the data in the sectors (44) comprises interlaced audio data, combined into a common file.

Beard discloses a system for multiplexing multi-track digital audio signals onto a single, conventional recording media.

Regarding **Claim 24**, Beard, in view of the teachings of other applied reference(s), at least suggests:

> a means for encoding (16 and 28 of Lydecker in view of Mux 2 of Beard, Figure 1) individual sound sources (C1-Cn, Figure 1; col. 3., line 27 - col. 4, line 8 of Beard) and a database describing the constraints and relating constraint variables (ACVD data stored in memory 20 of Lydecker, para. 0017-0027, in view of constraint control data disclosed by Delerue)
>
> into a common audio file (4 of Beard, col. 4, lines 9-13 in view of program data, para. 0016, and sectors, Figure 2, of Lydecker) through interlacing (interlaced audio data, Figure 3 of Beard, in view of putting such data in part 44, which interlaced over entire disc with control data in part

46 of a sector in Lydecker. Para. 0029-0030; `common audio file' considered to be at least suggested by Lydecker and Beard, as Beard teaches multichannel audio signal into one file, and sectors such as shown in Lydecker are subparts of an overall file).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the compression, multiplexing, and formatting of Beard as part of the mixing processes of the multichannel signals in the system of Delerue in view of O'Connell and Mitsuhashi and Lydecker. The motivation behind such a modification would have been that such compression and multiplexing would have enabled a much higher quality, multichannel audio signal to be stored (in sectors 44, for example) on the resulting DVD or recorded medium than was traditionally provided for by such a recording medium.

Regarding **Claim 25**, Lydecker, in view of the teachings of other applied reference(s), at least suggests:

means for decoding (52 and other control function circuitry) said common audio file (from sectors, Figure 2 in view of file 4 of Beard) in synchronism (in a complementary manner) with said encoding means

data originally encoded by Lydecker, para. 0028 is returned to separate data, para. 0031; considered in view of re-establishing audio data in system of Beard, col. 5, lines 3-7).

Regarding **Claim 39**, Beard, in view of the teachings of other applied reference(s), at least suggests:

said tracks are interlaced (Figure 3, col. 5, lines 15-42)

Regarding **Claim 41**, Beard, in view of the teachings of other applied reference(s), at least suggests:

Storage medium in the form of a computer hard disk (multiplexed audio and control data file of Lydecker, para. 0028 in view of multiplexed data of Beard, col. 4, lines 9-13)

12. **Claims 27-30 and 34-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Delerue in view of O'Connell, Mitsuhashi, and Lydecker as applied above, and in further view of Bargen, B. et al., "Inside DirectX", Microsoft Press, Redmond, WA, 1998., pages 3-9, 26-29, 203-205, 223-233, 241-247, 249-266. Hereafter, this reference will be referred to as "DirectX".

As detailed above, Delerue discloses a music spatialization system, wherein sources are represented as icons in a graphical space, movements of icons by a user reflect desired spatialization of the corresponding sources in a virtual sound field, and rules may be applied to sources regarding the desired, permissible movement of the sources within the sound field. O'Connell discloses a system for merging functional components in a graphical sound field control system. Mitsuhashi teaches that grouped audio signals may be controlled in a unitary manner in regards to the groupings. Lydecker discloses the combining of both audio and control data onto a disc media.

O'Connell particularly teaches the use of a sound accelerator board as part of a system running a graphically based audio program or engine (col. 4, lines 57-61).

Delerue in view of O'Connell, Mitsuhashi, and Lydecker does not

clearly teach or suggest:

three-dimensional sound buffer means,

in which a writing task and a reading task for each sound source are synchronized

said means thereby relaying said audio stream coming from an audio file into a spatialisation controller module and

relaying said database describing the constraints and relating constraint variables for each music title into said constraint module means

DirectX is a middleware software platform produced by Microsoft comprising tools for the implementation of video and audio in a computer environment.

Regarding **Claim 27**, DirectX, in view of the teachings of other applied reference(s), at least suggests:

further comprising three-dimensional sound buffer means (page 257-259), in which a writing task and a reading task for each sound source are synchronized (page 241)

said means thereby relaying said audio stream coming from an audio file into a spatialisation controller module (buffers are source of sound, page 203-204, in view of application of sound sources (via 50) to code representing spatialization unit 5 of Delerue, para. 0028) and

relaying said database describing the constraints and relating constraint variables for each music title into said constraint module means (output of control data to control buffers in Lydecker, para 0031 and 0041; in view of constraints stored as controls in system of Delerue, para. 0024).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the system of Delerue in view of O'Connell, Mitsuhashi, and Lydecker utilizing the DirectX software platform. The motivation behind such a modification would have been that a composite system implemented in such a manner would have provided access for the spatialization system to multimedia hardware in a device-independent manner, enabled hardware advances to be taken advantage of as they occur, and maximized hardware support across a variety of hardware configurations. Utilizing buffers on a sound card, as is noted by DirectX, would have ensured that a throughput sound would take the shortest route to a primary buffer, the main output buffer for a sound card. Utilizing the 3D sound capabilities of DirectX would have enabled the implementation of real- time, fully animated 3D environments under the Windows operating system.

Regarding **Claim 28**, Delerue, in view of the teachings of other applied reference(s), at least suggests:

wherein said spatialisation controller module (code implementing spatialization unit 5) further comprises a scheduler means for connecting (circuitry that applies solutions for intermediate sample positions as determined by solver 3 to unit 5, in order to establish the impression that the spatialization system reacts continuously) said constraint system module (code implementing constraint solver 3) and said spatialisation controller module (code implementing spatialization unit 5).

Regarding **Claim 29**, DirectX, in view of the teachings of other applied reference(s), at least suggests:

wherein said spatialisation controller module (code implementing spatialization unit 5) comprises static audio secondary buffer means (page 225).

Regarding **Claim 30**, DirectX, in view of the teachings of other applied reference(s), at least suggests:

comprising a timer means for waking up said writing task at predetermined intervals (code that regularly polls buffer for purpose of delivering data thereto; operates at regular intervals, pages 241-242)

Regarding **Claim 34**, Lydecker in view of DirectX, in view of the teachings of other applied reference(s), at least suggests:

wherein said computer (para. 0064 of Delerue) comprises a three-dimensional sound buffer (pages 257-259 of DirectX) for storing contents extracted from data reader (application of sound data to buffers in Lydecker, para. 0031, in view of sound sources as secondary buffers - which may be 3D - in DirectX, pages 203-204 and 257-259).

Regarding **Claim 35**, DirectX, in view of the teachings of other applied reference(s), at least suggests:

wherein said sound buffer is controlled through a dynamic link library (implementing programs on DirectX platform involves linking code to DirectX libraries, which include interface methods for 3d buffers, pages 26-27 and 259-261).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Flanders whose telephone number is (571) 272-7516. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7546. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

acf

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